ISSN: 2658-8455
Volume 5, Issue 3 (2024), pp. 284-311.

IJAFAME
International Journal of Accounting, Finance, Auditing, Management & Economics

Corporate Income Tax (CIT) and Capital

L'impôt sur les sociétés (IS) et le capital

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Disclosure Statement :	Authors are not aware of any findings that might be perceived as affecting the objectivity of this study and they are responsible for any plagiarism in this paper.
Conflict of Interest :	The authors report no conflicts of interest.
Cite this article :	AGOSSADOU, S. T. M. D. C. (2024). Corporate Income Tax (CIT) and Capital. International Journal of Accounting, Finance, Auditing, Management and Economics, 5(3), 284-311. https://doi.org/10.5281/zenodo.10826332
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Received: January 30, 2024 *Accepted: March 14, 2024*

International Journal of Accounting, Finance, Auditing, Management and Economics - IJAFAME
ISSN: 2658-8455
Volume 5, Issue 3 (2024)

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Abstract:

This research consists of verifying whether CIT has an effect on capital given the financing risk incurred. A review of several capital theories has shown that CIT is one of the main determinants of a firm's capital structure. The inclusion of CIT in capital structure models continues to divide the world of corporate finance. Debt interest deduction in computing CIT reinforces the controversy over the question of the capital structure that optimizes the tax savings provided by this deduction. The consequence is the existence of two opposing groups on the optimum capital structure: on the one hand, the group of those who believe that there is one and only one optimal capital structure, and on the other, the group of those who reject out of hand any possibility of an optimal capital structure.

The sample starts with a case study of two hypothetical identical firms, one indebted and the other non-indebted, with the same profitable investment project over a period of time, and ends with 101 pairs of identical firms belonging to different classes of financing risk. The hypothesis of non-gratuity of cost and income is used, and capital markets are assumed to be pure and perfect.

The results confirm that CIT has no effect on the structure, value, cost and return of capital for a given financing risk, and reveal the existence of a third source of financing called "public capital", whose cost is the corporate capital tax rate (CCTR). There is no longer any question of thinking about the optimum capital structure, which is a pure financial illusion. This paper is one of the first to show that CIT does not affect capital, and to propose a model that explains capital structure behavior in the presence of CIT.

Keywords: Capital structure; firm value; weighted average cost of capital (WACC); return on investment; financial integration of corporate tax.

JEL Classification: G32; G34; G38; H24; H26; H32

Paper type: Empirical Research

ISSN: 2658-8455
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1. Introduction

The effect of corporate income tax (CIT) on capital at the firm level has been one of the most controversial issues in finance from the advocates of traditional theory to the present day, including Durand (1952), Modigliani and Miller (1958; 1963), Baxter (1967), Akerlof (1970), Black & Scholes (1973), Hicks (1975), Jensen & Meckling (1976), Ross (1977), Leland & Pyle (1977), Myers (1977), Myers & Majluf (1984), Kane *et al.* (1984), Brennan *et al.* (1984), Jensen (1986), Barton & Gordon (1987), Williamson (1988) and Baker & Wurgler (2002). Certainly, in any given national economy with the assumption that there are no taxes, debt capital generally costs less than equity capital at the firm level.

In this context, traditional capital structure theory and Durand's (1952) Net Profit theory asserted that the firm's weighted average cost of capital and capital value vary with financial leverage[1]. In contrast, Modigliani and Miller (1958, pp. 268 269, p. 271, p. 288) were the first to develop the neutrality theory of capital structure, capital value, cost of capital, and capital return, despite the relative non-expensiveness of the cost of debt capital to the cost of equity capital. However, most corporate income tax systems allow interest on debt to be deducted when calculating corporate income tax. This tax deduction of interest theoretically reduces the cost of debt, and therefore makes debt capital even cheaper theoretically than equity capital. However with the inclusion of corporation tax, Modigliani and Miller's basic theory has attracted a great deal of criticism in the literature review.

For example, Modigliani and Miller (1963: pp. 435-440) went back to their 1958 basic theory and demonstrated that the value of an indebted firm outperforms that of an unindebted firm by a premium equal to the capitalization value of the annual tax saving. But other authors, such as Baxter (1967: p. 395), Stiglitz (1969: p. 784), Gruber and Warner (1977), Kraus and Litzenberger (1973: p. 911), Horne (1974) and Greenwald *et al.* (1984), have proposed the Trade-Off Theory (TOT), which takes into account the trade-off between the costs of bankruptcy and the tax benefits of indebtedness. Jensen and Meckling (1976: p. 308) proposed the agency theory, which recognizes the existence of conflicts between managers, shareholders, and financial creditors, the resolution of which generates costs called "agency costs" or "agency costs", which are grouped into the agency cost of equity caused by conflicts of interest between shareholders and managers, and the agency cost of debt caused by conflicts of interest between creditors and shareholders. The signaling theory invented by Ross (1977: p. 23), postulates that if managers have privileged information, their choice of capital structure will signal the information to the market. Thus, Leland and Pyle (1977) demonstrated that the fraction of equity held by managers is positively correlated with the value of the firm, which is statistically related to its financial structure. On the other hand, the pecking order theory (POT) argues that there is no relevant capital structure. According to this theory, to finance an investment in a context of asymmetric information, self-financing is preferable to debt, in which debt is preferable to an equity issue (Myers and Majluf 1984: p. 581).

In short, the players in the world of corporate finance are torn between two contradictory theses in the presence of the CIT: the capital structure neutrality thesis and the capital structure non-neutrality thesis. What's more, the proponents of a given thesis are far from agreeing on the theories developed on the structure, value, cost, and return of capital. This state of affairs among corporate finance theorists and practitioners leaves much to be desired. In 1981, in the first edition of *Principles of Corporate Finance,* Brealey and Myers, quoted in Colot and Croquet (2007: p. 177), had a field day asking: "How can we explain the financing structure of firms?" Today, this same question is still relevant. For Colot and Croquet (2007: p. 178), this proves that, despite a wealth of empirical and theoretical work, there are still many grey areas when it

[1] *A company's financial leverage is the ratio of financial debt to shareholders' equity.*

comes to determining the financial structure of firms. "On this last point, Charreaux's (1997) conclusions concur with those of Trahan and Gitman (1995), since he confirms the existence of a wide gap between financial theory and financial practice" (Colot and Croquet 2007: p. 178). Carpentier (2000: p. 3), quoted in Colot and Croquet (2007: p. 178), wrote: "Almost forty years after the pioneering articles by Modigliani and Miller (1958, 1963), it has to be said that there are still no theories capable of explaining and guiding firms' financing choices (...)".
Overall, this research aims to answer the question of whether CIT has an effect on capital at the firm level. Accordingly, this research will examine the following research questions:
RQ1: Does CIT affect capital structure?
RQ2: Does CIT affect the total value of capital?
RQ3: Does CIT affect the weighted average cost of capital?
RQ4: Does CIT affect the return on capital?
This paper aims to test whether CIT affects capital, by answering these four research questions. The paper is structured in four sections. Section 1 is devoted to reviewing the literature and formulating the research hypotheses. Section 2 outlines the methodology. Section 3 presents the results and section 4 the conclusion.

2. Literature review and research hypotheses

The effect of corporate income tax on capital has been one of the most controversial topics in corporate finance for several decades. Capital tax theories and research hypotheses are developed for this purpose.

2.1. Capital tax theories

Most neoclassical theories have explicitly taken account of corporate taxation in their working hypotheses. These include Modigliani & Miller (1963), trade-off theory (TOT), agency theory, signal theory, and hierarchical financing theory (POT).

2.1.1. The theory of Modigliani & Miller (1963) and its empirical review

According to the theory of Modigliani and Miller (1963), in the case of CIT, the "tax subsidy to debt" reduces the weighted average cost of capital as a function of financial leverage. The "mechanical" consequence of this finding is that it is in the firm's interest only to take on as much debt as possible to minimize its cost and maximize its value. In attempting to empirically verify Modigliani and Miller's theory, subsequent studies have taken into account several aspects concerning the tax regime, the corporate form, and the environment in which the company is established. Some studies have focused on the effect of taxation on debt levels by firms with different organizational forms. Scholes *et al*. (1992) were interested in testing the hypothesis that companies subject to corporate income tax have a higher level of indebtedness than partnerships. They argued that the former companies realize significant tax savings from debt because the company's effective tax rate exceeds the individual's statutory rate since the income distributed to shareholders as dividends is subject to double taxation.
In contrast, Solomon (1963: p. 276) argues that, in a position of extreme indebtedness, the cost of capital must rise. This is because excessive debt levels will prompt markets to react by demanding higher rates of return. Consequently, to minimize the weighted average cost of capital, companies will avoid a pure debt position and seek an optimal combination of debt and equity. Furthermore, Kim (1978: 45) observes that during the period from 1963 to 1970, non-financial companies in the USA were financed by only one-third of debt. This finding provides circumstantial evidence that, in the presence of taxes, companies will avoid a position of pure debt.

2.1.2. Baxter's (1967) bankruptcy cost theory and empirical review

The optimal financing policy for the firm recommended by Modigliani and Miller (1963: p. 440) is to take on as much debt as possible, to benefit from the "tax subsidy for debt" due to the deductibility of financial interest. But the more debt a company takes on, the greater the risk of not being able to service it. This is why the Trade-Off Theory (TOT) has been proposed, which takes into account the trade-off between the costs of bankruptcy and the tax benefits of debt. In this context, the $\mathbf{V_L}$ value of an indebted firm is: $\mathbf{V_L = V_U + \tau D - C_L}$; where **D** represents the amount of debt; $\boldsymbol{\tau}$ the income tax rate; $\mathbf{C_L}$ is the present value of bankruptcy costs linked to non-zero financial leverage and $\mathbf{V_U}$ is the value of a debt-free firm identical to the indebted firm.

There are four main predictions of the trade-off theory. First, trade-off theory predicts that firms will have a target leverage ratio and that these ratios will vary from firm to firm. This prediction is confirmed by Graham and Harvey (2001: p. 187), who report that the majority of CFOs surveyed agreed that they follow a target debt ratio. Secondly, the trade-off theory predicts that companies with relatively secure tangible assets will be less exposed to the costs of financial distress, and will therefore be expected to borrow more. Conversely, companies with riskier intangible assets will be more exposed to the costs of financial distress and should borrow less. This prediction is confirmed by Rajan and Zingales (1995: p. 1453) for firms in seven developed countries and Frank and Goyal (2009: p. 26) for non-financial firms in the USA. Thirdly, trade-off theory predicts that higher marginal tax rates will be associated with higher levels of leverage. This is due to the tax deductibility of interest. Using tests based on incremental decisions, MacKie-Mason (1990: p. 1471) documents that firms facing higher marginal tax rates are more likely to have higher leverage ratios, and that firms with low marginal tax rates will issue more equity relative to debt. Using data from over 10,000 companies, Graham (1996: p. 41) finds a statistically significant positive association between debt ratios and marginal tax rates.

Finally, trade-off theory predicts that firms with more taxable income and relatively few non-debt tax shields, such as investment tax credits and depreciation and amortization, will have more incentives to borrow (De Angelo and Masulis 1980: p. 4). Consequently, to take advantage of tax shields on interest, companies with fewer non-debt tax shields should be expected to borrow more. Conversely, companies with more non-debt tax shields should have less debt in their capital structure. Bradley *et al.* (1984: p. 873) find contrasting evidence to this prediction. They report a positive relationship between non-debt tax shields and debt-to-enterprise value ratios. This result is confirmed by Chakraborty (2010: p. 310) for companies in India. This positive association could also mean that companies with high non-debt tax shields, such as depreciation, have tangible assets in place. This allows them to support more debt. On the contrary, Titman and Wessels (1988: p. 13) report an insignificant negative association between non-debt tax shields and leverage. Similarly, Ozkan (2001: p. 187) uses a dynamic capital structure model for UK firms and reports a significant negative relationship between non-debt tax shields and leverage.

Moreover, the probability of bankruptcy is not only linked to leverage behavior; it is also linked to equity behavior. A firm with zero financial leverage may be threatened by the costs of bankruptcy under conditions of insufficient equity and zero debt capacity. But TOT theory does not consider this possibility and deducts the present value $\mathbf{C_U}$ of the bankruptcy costs associated with zero financial leverage from the value $\mathbf{V_U}$ of said company so that the net value of the company with zero financial leverage would be $\mathbf{NV_U}$, where $\mathbf{NV_U = V_U - C_U}$. However since the costs of bankruptcy or financial distress cannot be expressed precisely, no formula has yet been developed to determine exactly the optimal level of leverage for a company (Ross *et al.* 2008: p. 466).

2.1.3. Jensen & Meckling (1976)'s agency cost theory and empirical review

Jensen and Meckling (1976: p. 308) proposed agency theory, based on the idea that managers will not always act in the best interests of shareholders. This theory recognizes the existence of conflicts between managers, shareholders, and financial creditors, the resolution of which generates costs called "agency costs" or "agency costs", which are grouped into the agency cost of equity caused by conflicts of interest between shareholders and managers, and the agency cost of debt caused by conflicts of interest between creditors and shareholders. Considerable work has been done to test the validity of the agency cost hypothesis. For example, Kim and Sorensen (1986: p. 139) detect the presence of agency costs in listed companies in the *Compustat* database in the form of a strong relationship between the financial participation of corporate executives and leverage. Vilasuso and Minkler (2001: p. 65) use a dynamic capital structure model on a set of 28 public companies and demonstrate that agency costs are associated with changes in leverage. Harvey *et al.* (2004: p. 3) investigate whether debt can control the effects of agency costs for a set of emerging market firms, and observe that the benefits of debt are concentrated among firms with high agency costs.

Berger and Bonaccorsi di Patti (2006: p. 1069) develop an efficient earnings metric as a measure of firm performance and confirm the predictions of agency theory that higher leverage is positively related to earnings efficiency. However, Brounen *et al.* (2006: p. 1409) surveyed managers in European countries and found no evidence that agency costs influence capital structure decisions. Overall, the evidence suggests that there is some support for agency theory. The costs of monitoring managers to ensure that they act in the best interests of shareholders are referred to as agency costs. The greater the need to monitor managers, the higher the agency costs. Pinegar and Wilbricht (1989) found that the principal-agent problem can be addressed to some extent by the capital structure, by increasing the level of debt, without radically increasing agency costs. Similarly, Lubatkin and Chatterjee (1994) argue that increasing the debt-to-equity ratio will help companies ensure that managers run the business more efficiently. As a result, managers will return excess cash flow to shareholders rather than investing in NPV-negative projects, since managers will have to ensure that the company's debt obligations are repaid. Consequently, as debt levels rise, lenders and shareholders become the main parties in the corporate governance structure.

But there are still other conflicts that agency theory has not been able to identify, such as the "conflict between shareholders and the State" or the "conflict between company managers and the State", the consequences of which can lead to corporate tax "fiscal control" or even "tax reassessment". According to Desai *et al.* (2007: p. 2), the State, thanks to its tax claim on cash flows, is de facto the largest minority shareholder in almost all companies. Yet State shares are not part of the standard analysis of corporate governance, which has generally focused on legal protections for outside investors (as in La Porta *et al.* 1998 and Shleifer and Wolfenzon 2002), the role of boards of directors (e.g. Hermalin and Weisbach 1998) and the presence of large shareholders (Morck *et al.* 1988). This absence is even more remarkable, given that corporate taxes are an integral part of the literature on corporate finance and investment decisions (e.g. Graham 2006).

2.1.4. Ross's (1977) signaling theory and empirical review

Signaling theory was first coined by Ross (1977: p. 23), who postulates that if managers have inside information, their choice of capital structure will signal the information to the market. Thus, Leland and Pyle (1977) demonstrated that the fraction of equity held by managers is positively correlated with the value of the firm, which is statistically related to its financial structure. In their view, if the firm's value increases as a function of the fraction of equity, the higher the fraction of equity, the greater the firm's debt capacity, and consequently the greater its recourse to debt. Noting the inconsistency between trade-off theory and observed hierarchical financing theory, Myers and Majluf (1984) proposed a new theory, called signaling, or the asymmetric information theory of capital structure. They demonstrated that with asymmetric information, share issues are rationally interpreted on average as bad news since managers are motivated to issue shares when the stock is too expensive. Ross (1977)'s model suggests that firm value will increase with leverage since increasing leverage increases the perception of market value.

Asquith and Mullins (1983), Masulis and Korwar (1986), and Mikkelson and Partch (1986) have also observed empirically that announcements of new share issues are greeted by a sharp fall in share prices. This is one of the main reasons why equity issues are relatively rare among large, established companies. Debt also plays an important role in enabling investors to generate information useful for monitoring management and implementing effective operating decisions (Harris and Raviv 1990). Because of the information asymmetry that reigns, in reality, in financial markets, debt appears here as a positive signal because of the bankruptcy risk associated with it (Croquet *et al.* 2013: p. 113).

2.1.5. Myers (1977)'s hierarchical financing theory and empirical review

According to hierarchical financing theory, to finance an investment in a context of asymmetric information, self-financing is preferable to debt, in which debt is preferable to an equity issue (Myers and Majluf 1984: p. 581). For these authors, there is no capital structure relevant to the pecking order theory-POT. A number of studies have confirmed the existence of hierarchical financing theory. Rajan and Zingales (1995: p. 1454) use a dataset from seven industrialized countries and find evidence for the hierarchical financing theory in the form of a negative association between leverage and profitability. Using a sample of 157 U.S. companies, Shyam-Sunder and Myers (1999: p. 219) find support for the predictions of hierarchical finance theory. Although this is an influential result, a sample of 157 companies is relatively small compared with all listed companies in the USA. According to Frank and Goyal (2003: p. 218), this raises questions as to whether the theory is widely applicable. Using flow-of-funds data for a larger sample of US companies, they discovered that net equity issuance tracks the financing gap more precisely than net debt issuance. This finding offers contrasting evidence to the theory's predictions. Helwege and Liang (1996: p. 429) provide a direct test of hierarchical financing theory by examining the capital structures of 500 small companies that went public in 1983. They find that the use of external financing does not follow hierarchical financing theory.

On the contrary, Flannery and Rangan (2006: p. 478) adopt a partial leverage adjustment model for listed companies in the *Compustat* database (CRSP[2]) and confirm the existence of hierarchical financing. Leary and Roberts (2010: p. 351) use simulation techniques to test the accuracy of POT theory. They carry out their analysis by allowing the firm's debt capacity to vary according to other variables associated with the trade-off theory. They find that the predictive power of the POT theory increases significantly with variation. This finding suggests that POT and TOT theories play an important role in explaining financing decisions. Seifert and Gonenc (2010: p. 11) regress net debt issuance on a financial deficit variable for companies in 23 emerging market economies. They conclude that hierarchical financing is prevalent only in emerging markets where there are issues of asymmetric information and significant agency costs. This finding supports the theory that financing decisions are a function of the prevailing market conditions in which companies operate.

Empirical tests to see whether POT theory or TOT theory is a better predictor of observed capital structures find support for both theories of capital structure (Shyam-Sunder and Myers 1999; Fama and French 2000).

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[2] *CRSP is called Center for Research in Security Price*

2.2. Formulation of research hypotheses

The relationship between CIT and capital structure, capital value, cost of capital, and capital return is not easy to explain. Capital structure still remains a "puzzle" for many authors (Barclay and Smith 2005; DeAngelo 2022; Hossain 2021; Myers 1984; Poursoleyman *et al.* 2021). The paradox is that there was a theory by Modigliani and Miller (1958) that capital structure was irrelevant, as were capital value, cost of capital, and return on capital investment. However the inclusion of corporate income tax calls this theory into question, since, due to debt interest deduction in computing CIT, a capital structure with non-zero financial leverage generates a tax surplus for the firm, compared with a capital structure with zero financial leverage. This raises the problem of choosing the optimal capital structure. An analysis of the various theories on this subject shows that they lead to at least one of the following conclusions:

- The *attractive unlimited non-neutrality* of the capital structure in which the total value of capital is increasing and the weighted average cost of capital is decreasing as a function of financial leverage.
- The *attractive limited non-neutrality* of the capital structure in which the total value of capital is increasing and the weighted average cost of capital is decreasing over a leverage interval.
- The *neutrality* of the capital structure in which the total value of capital is constant and the weighted average cost of capital is constant, whatever the level of financial leverage.
- The *repulsive limited non-neutrality* of the capital structure in which the total value of capital is decreasing and the weighted average cost of capital is increasing over a range of financial leverage.

The author follows the basic theory of Modigliani and Miller (1958), but takes account of the corporate income tax, and therefore proposes the following four research hypotheses:

H1: Corporate income tax (CIT) does not affect capital structure (CS).
H2: Corporate income tax (CIT) does not affect total capital value (V).
H3: Corporate income tax (CIT) does not affect the weighted average cost (K) of capital.
H4: Corporate income tax (CIT) does not affect return on capital (R).

2- Methodology

For any researcher wishing to carry out a rigorous study, the choice of an epistemological positioning becomes necessary, as the latter enables them to consolidate the validity and relevance of their research (Thiétart 2014, cited in Tibi *et al.* 2024: p. 9). Thus, to achieve the objective of this research, we have chosen an objectivist ontological and positivist epistemological posture, reflected in a predominant quantitative analysis approach with a hypothetico-deductive reasoning logic. The methodology covers study design, sampling, and modelling.

2.1- Study design

From the point of view of the non-gratuity of cost and income at the firm level, CIT is considered the cost of capital used by the firm, in the same way as interest and dividends, which are respectively the costs of borrowed capital and equity capital. To this end, we have used eight postulates, which are respectively stated as follows: *P1: The value (G) of taxable funds (taxable capital) used by a firm at a given date is the linear combination of the value (S) of equity capital and the value (D) of financial debt at that date.* We can therefore write:

$$G = \alpha S + \beta D; \qquad \alpha \geq 0, \beta \geq 0 \qquad (1)$$

For convenience, we used the following α=β=1; equation (1) becomes:

$$\mathbf{G = S + D} \qquad (\mathbf{2})$$

ISSN: 2658-8455
Volume 5, Issue 3 (2024), pp. 284-311.

The second postulate states that: *P2: All stocks, bonds, and taxes*[3] *are assumed to generate income per unit of time. Each share has a tax attached to it, and each bond has a tax attached to it.* The third is *P3: Capital markets are pure and perfect.* This postulate implies that the price contains all the information. This information is then free and accessible to all lenders. Similarly, transaction costs in these markets are non-existent. The others are *P4: Firms issue financial securities representing either equity and taxable funds, or debt and taxable funds. These assets are divisible, making them accessible to several financiers. P5: Lending and borrowing transactions are carried out at the same interest rate for a given financing risk, but vary according to that risk. This rate applies to lenders as well as to companies. P6: There is no risk of bankruptcy or default. P7: Earnings are fully distributed. P8: Sources of equity, debt, and taxable financing are homogeneous, and the firm's capital is fully invested.*

The design of the study is based on a numerical case study involving two firms belonging to the same financing risk class, identical in all respects except that one is exclusively equity-financed and the other contains a fraction of debt in its capital structure. The case study consists of a pair of firms ($\mathbf{E_U}$; $\mathbf{E_L}$) belonging to the same financing risk class, identical in all respects except that firm $\mathbf{E_U}$ has zero financial leverage and, firm $\mathbf{E_L}$, has non-zero financial leverage or non-zero "financial debt **D** to equity $\mathbf{S_L}$" rato, i.e. $\frac{\mathbf{D}}{\mathbf{S_L}} \neq \mathbf{0}$. The data (in billions of F.XOF for the amounts) for these two firms concerning the decision to invest one year ahead are presented in Table n. I.

According to Cobbaut (1997), the capital structure is the set of financing resources made available to the company, either for an indefinite period (equity capital) or for a relatively long time (very different types of medium- and long-term debt). In our approach, the capital structure is the sum of equity **S**, borrowed funds **D,** and taxable funds **G** available to the firm for value-creating investment. Consequently, a firm's capital structure is the combination of equity, debt, and taxable funds to finance its economic assets.

The value (V) of the firm's capital or investment retained for the purposes of this work is that which a financial investor is prepared to pay to acquire the firm, given the profitability he expects from the firm. This is a company's financial value, i.e. its asset value (stock value) or its stock market value (flow or profitability value). This value is to be distinguished from the economic or strategic value, developed by Miller and Modigliani (1961, 1966), which is that which an industrial investor is prepared to pay for a company in order to create value as a going concern.

The main objective pursued in making financial decisions is the maximization of shareholder wealth, i.e. the firm's capital value. The question raised is: what is the most attractive capital structure for the firm in an economy where the State collects corporate income tax? To answer this very question, Albouy (1997) puts forward the idea that the relationship between the choice of capital structure, firm value and the cost of capital is not easy to establish; it has been the subject of numerous, often contradictory studies.

[3] Taxes are considered as financial securities conferring on the State the right of public authority.

Table n. I: Investment Project of two identical Firms E_U and E_L

Elements	Firm E_U	Firm E_L
Equity S_U or S_L	100	50
Financial debts D	-	50
Investment I	100	100
Operating revenue (DR1)	326	326
Operating expenses (DD1)	210	210
Minimum cash flow required or EBITDA (DR1-DD1)	116	116
Reenactment of		
*** Equity capital S_U or S_L (to be recovered)**	100	50
*** Debt capital D (to be repaid)**	-	50
Depreciation allowance (DA)	100	100
EBIT	16	16
Remuneration		
*** Interest (of debt D at rate r = 8%)**	-	4
EBT	16	12
*** Corporation income tax (CIT) at rate τ = 50%**	8	6
*** Dividends (of equity S_U and S_L)**	8	6

Source: Adapted from Cobbaut (1997)

The capital structures (CS) of the two firms $\mathbf{E_U}$ and $\mathbf{E_L}$ are respectively:

$$\mathbf{CS_U = \begin{pmatrix} S_U & k_U \\ 0 & 0 \\ G_U & t \end{pmatrix} = \begin{pmatrix} S_U & k_U \\ 0 & 0 \\ S_U & t \end{pmatrix}} \quad (3)$$

and

$$\mathbf{CS_L = \begin{pmatrix} S_L & k_L \\ D & r \\ G_L & t \end{pmatrix} = \begin{pmatrix} S_L & k_L \\ D & r \\ S_L + D & t \end{pmatrix}} \quad (4)$$

Remunerations(X) for all providers of funds for E_U and E_L firms are respectively:

$$\mathbf{X_U = [E(RNE) - tS_U] + tS_U = E(RNE)} \quad (5)$$

and

$$\mathbf{X_L = [(E(RNE) - rD - t(S_L + D)] + rD + t(S_L + D) = E(RNE)} \quad (6)$$

Where E(RNE) is the mathematical expectation of operating income. Under these conditions, the weighted average capital costs of E_U and E_L firms are respectively:

$$\mathbf{K_U = k_U \frac{S_U}{S_U + G_U} + t \frac{G_U}{S_U + G_U}} \quad (7)$$

and

$$\mathbf{K_L = k_L \frac{S_L}{S_L + D + G_L} + r \frac{D}{S_L + D + G_L} + t \frac{G_L}{S_L + D + G_L}} \quad (8)$$

From equations (3) and (4) on the capital structure of E_U and E_L firms, we have:

$$\mathbf{K_U = \frac{k_U}{2} + \frac{t}{2}} \quad (9)$$

and

$$\mathbf{K_L = k_L \frac{S_L}{2(S_L + D)} + r \frac{D}{2(S_L + D)} + \frac{t}{2}} \quad (10)$$

where: $G_U=S_U$=taxable funds used by the E_U firm; $k_U=E_U$ firm's cost of equity; $G_L=S_L+D$=taxable funds used by firm E_L; $k_L= E_L$ firm's cost of equity capital. The book or market value of the income stream will be obtained by capitalization at the weighted average cost of capital. E_U and E_L therefore have the following respective capital values:

$$\mathbf{V_U = \frac{X_U}{K_U} = \frac{E(RNE)}{K_U} = S_U + G_U = 2S_U} \quad (11)$$

and

$$\mathbf{V_L = \frac{X_L}{K_L} = \frac{E(RNE)}{K_L} = S_L + D + G_L = 2(S_L + D)} \quad (12)$$

Since E_U and E_L are identical, we have:

$$\mathbf{S_U = S_L + D} \quad (13)$$

It follows that identical E_U and E_L firms have the same capital value and the same weighted average cost of capital:

$$\mathbf{V_U = V_L} \quad (14)$$

and

$$\mathbf{K_U = K_L} \quad (15)$$

Since the two identical firms E_U and E_L have the same weighted average cost of capital, we derive the following relationships from equations (9), (10), and (15):

$$\mathbf{k_U = \frac{k_L S_L + tD}{S_L + D}} \quad (16)$$

$$\mathbf{k_L = k_U + (k_U - r)\frac{D}{S_L}} \quad (17)$$

$$\mathbf{k_U = 2K_U - t} \quad (18)$$

$$\mathbf{k_L = (2K_L - t) + (K_L - r)\frac{D}{S_L} + (K_L - t)\frac{D}{S_L}} \quad (19)$$

$$\mathbf{k_U = 2K - t} \quad (20)$$

$$\mathbf{k_L = (2K - t) + (K - r)\frac{D}{S_L} + (K - t)\frac{D}{S_L}} \quad (21)$$

where: **K**=weighted average cost of capital of the financing risk class of identical pairs of firms (E_U; E_L).

2.2. Sampling

The design of the theoretical sample is based on this case study, from which a sample of 202 identical firms, i.e. 101 pairs of identical firms, belonging to different financing risk classes, has been drawn. The 101 pairs of identical firms are obtained by taking into account the variation in the financing risk class of the identical firms. In fact, the 101 pairs of firms (E_{Uj}; E_{Lj}) belonging to the same class c_j (j being the natural number from 0 to 100) of given financing risk, are designed by varying per monetary unit, the financial debts **D** from 0 to 100, so that the sum of equity $\mathbf{S_L}$ and borrowed funds **D** of a firm with non-zero financial leverage, except for the class c_0 of financing risk 0, is equal to 100 monetary units. The financing risk increases from a given class of identical firm pairs to another higher class of identical firm pairs, so that in class c_0, the risk is minimal or zero, and in class c_{100}, it is maximal.
The degree j of risk in any c_j class is not easy to estimate, but we can get an idea. In fact, in a given c_j class, where j varies from 0 to 100, the debt financing of the E_L firm with non-zero financial leverage results from the free consent of bondholders to give up their funds in view of the risk incurred. Under these conditions, these bondholders, generally risk-averse, are only willing to contribute (100-j) monetary units (MU) to the capital structure of the indebted E_L firm, given the risk level of its class; the balance, which is the 100 MU complement of (100-j), i.e. j MU, is financed by the shareholders of the indebted E_L firm. We can therefore say that the higher the risk level of a c_j class, the higher the value of j, and vice versa. For example, in class c_0, where risk is minimal or almost nil, bondholders agree to finance the indebted firm E_{L0} to the tune of MU 100 against MU 0 from shareholders; whereas in class c_{100}, where risk is maximal, bondholders finance the indebted firm E_{L100} to the tune of MU 0 against MU 100 from shareholders. Under these conditions, the interest rate r remains constant in a given class c_j of financing risk j, but varies according to the class c_j of financing risk j of identical firms,

and the corporate tax rate on capital remains constant. For convenience, the cost r of debt varies by 2% from one c_j class to another.

2.3. Model and variables

The aim of this research is to verify whether CIT has an effect on capital. To this end, we have designed and implemented a model which states that "*CIT is the cost of a capital used by the firm*". This model integrates corporate tax into the theory of corporate finance as cost of a third source of financing known as “public funds” or taxable funds, like equity and borrowed funds referred to here as private funds. In this way, the State joins the group of the firm's financial partners, of which there are now three: shareholders, bondholders and the "taxholder" or State. We selected ten main variables to explain: capital structure, capital value, equity capital value, debt capital value, taxable capital value, cost of capital, equity cost of capital, debt cost of capital, taxable cost of capital and return on capital. The capital structure to be explained incorporates corporate tax as the cost of taxable capital used by the firm. Thus, the capital structure is the combination of equity, debt and taxable capital. The value of capital takes into account not only the value of equity and financial debt, but also the value of taxable funds in terms of corporation tax. The cost of capital is therefore the weighted average cost of equity, debt and taxable funds. The return on capital to be explained is the return on investment derived from capital, irrespective of the origin of the capital. This is earnings before interest and tax (EBIT). We have used graphs, tables and numerical data to explain certain results.

3. Results

The results obtained have enabled us to formulate new proposals on capital structure, capital values, capital costs and return on capital.

3.1. Capital structure

We have redefined capital structure and shown that CIT has no effect on capital structure.
"The capital structure (CS) of a firm E belonging to a given financing risk j class c_j, is the combination of equity(S), borrowed funds(D) and taxable funds(G) with their respective costs namely the cost of equity(k), the cost of borrowed funds(r) and the cost of taxable funds(t), made available to the firm to finance its economic assets and create value".
"The capital structure (SC) of a firm E belonging to a given financing risk j class c_j, has no effect on the value (V) of capital and the weighted average cost (K) of capital and can be written in analytical or synthetic matrix form".
By way of example, according to equations (3) and (4), the capital structures of identical firms E_{Uj} and E_{Lj} of classes c_j where j takes the 0, 50 and 100, are presented respectively as follows:
For c_0 class :

$$\mathbf{CS_{U0}} = \begin{pmatrix} \mathbf{S_{U0}} & \mathbf{k_{U0}} \\ \mathbf{0} & \mathbf{0} \\ \mathbf{G_{U0}} & \mathbf{t} \end{pmatrix} = \begin{pmatrix} \mathbf{100} & 7\% \\ \mathbf{0} & \mathbf{0} \\ \mathbf{100} & 7\% \end{pmatrix}$$

$$\mathbf{CS_{L0}} = \begin{pmatrix} \mathbf{S_{L0}} & \mathbf{k_{L0}} \\ \mathbf{D_0} & \mathbf{r_0} \\ \mathbf{G_{L0}} & \mathbf{t} \end{pmatrix} = \begin{pmatrix} \mathbf{0} & 8\% \\ \mathbf{100} & 7\% \\ \mathbf{100} & 7\% \end{pmatrix}$$

For c_{50} class :

$$\mathbf{CS_{U50}} = \begin{pmatrix} \mathbf{S_{U50}} & \mathbf{k_{U50}} \\ \mathbf{0} & \mathbf{0} \\ \mathbf{G_{U50}} & \mathbf{t} \end{pmatrix} = \begin{pmatrix} \mathbf{100} & 9\% \\ \mathbf{0} & \mathbf{0} \\ \mathbf{100} & 7\% \end{pmatrix}$$

ISSN: 2658-8455
Volume 5, Issue 3 (2024), pp. 284-311.

$$\mathbf{CS_{L50}} = \begin{pmatrix} \mathbf{S_{L50}} & \mathbf{k_{L50}} \\ \mathbf{D_{50}} & \mathbf{r_{50}} \\ \mathbf{G_{L50}} & \mathbf{t} \end{pmatrix} = \begin{pmatrix} \mathbf{50} & \mathbf{10\%} \\ \mathbf{50} & \mathbf{8\%} \\ \mathbf{100} & \mathbf{7\%} \end{pmatrix}$$

For c_{100} class :

$$\mathbf{CS_{U100}} = \begin{pmatrix} \mathbf{S_{U100}} & \mathbf{k_{U100}} \\ \mathbf{0} & \mathbf{0} \\ \mathbf{G_{U100}} & \mathbf{t} \end{pmatrix} = \begin{pmatrix} \mathbf{100} & \mathbf{12\%} \\ \mathbf{0} & \mathbf{0} \\ \mathbf{100} & \mathbf{7\%} \end{pmatrix}$$

$$\mathbf{CS_{L100}} = \begin{pmatrix} \mathbf{S_{L100}} & \mathbf{k_{L100}} \\ \mathbf{D_{100}} & \mathbf{r_{100}} \\ \mathbf{G_{L100}} & \mathbf{t} \end{pmatrix} = \begin{pmatrix} \mathbf{100} & \mathbf{12\%} \\ \mathbf{0} & \mathbf{9\%} \\ \mathbf{100} & \mathbf{7\%} \end{pmatrix}$$

3.2. Capital values

These are total, equity, debt and taxable capital values.

3.2.1. Total capital value

We have redefined capital value in presence of CIT.

"The capital value (book or market) of a firm belonging to a given class c_j of financing risk j, is independent of its capital structure and is obtained either by discounting operating cash flows and residual financing value at their corresponding rates - this is the output method of value - or by adding up the financing values of equity, debt and taxable capital - this is the input method of value".

By way of example, according to equations (11) and (12), the capital values of identical firms E_{Uj} and E_{Lj} in classes c_j, where j takes the values 0, 50 and 100, are presented respectively as follows:

For c_0 class :

$$\mathbf{V_{U0}} = \frac{\mathbf{X_{U0}}}{\mathbf{K_{U0}}} = \frac{\mathbf{14}}{\mathbf{7\%}} = \mathbf{100 + 100 = 200}$$

$$\mathbf{V_{L0}} = \frac{\mathbf{X_{L0}}}{\mathbf{K_{L0}}} = \frac{\mathbf{14}}{\mathbf{7\%}} = \mathbf{0 + 100 + 100 = 200}$$

For c_{50} class :

$$\mathbf{V_{U50}} = \frac{\mathbf{X_{U50}}}{\mathbf{K_{U50}}} = \frac{\mathbf{16}}{\mathbf{8\%}} = \mathbf{100 + 100 = 200}$$

$$\mathbf{V_{L50}} = \frac{\mathbf{X_{L50}}}{\mathbf{K_{L50}}} = \frac{\mathbf{16}}{\mathbf{8\%}} = \mathbf{50 + 50 + 100 = 200}$$

For c_{100} class :

$$\mathbf{V_{U100}} = \frac{\mathbf{X_{U100}}}{\mathbf{K_{U100}}} = \frac{\mathbf{19}}{\mathbf{9,5\%}} = \mathbf{100 + 100 = 200}$$

$$\mathbf{V_{L100}} = \frac{\mathbf{X_{L100}}}{\mathbf{K_{L100}}} = \frac{\mathbf{19}}{\mathbf{9,5\%}} = \mathbf{100 + 0 + 100 = 200}$$

This new proposition converges to Proposition I of Modigliani and Miller (1958, pp. 268 269) when the cost t (tax rate) of taxable funds takes the value zero (t=0%). The value of capital behaves in relation to financing risk j as follows:

"The capital value Vc_j of a firm is independent of the financing risk j of the classes cj of identical firms".

3.2.2. Equity value

We need to distinguish between firms with zero leverage and firms with non-zero leverage.

Equity value at zero leverage

Zero-leverage equity is the contribution made by zero-leverage shareholders.
"The S_U value of the equity of E_U firms with zero financial leverage, is a constant function of the financing risk j of classes c_j of identical firms. It expresses the risk indifference of the shareholders of said firms".

Value of non-zero leverage equity

Non-zero leverage equity behaves in terms of financing risk as follows:
"The S_L value of non-zero leverage E_L firms' equity is an increasing function of the financing risk j of the c_j classes of identical firms. It expresses the risk appetite of the shareholders of said firms.

3.2.3. Value of debt capital

Debt capital behaves as a function of financing risk as follows:
"The value D of the borrowed funds of E_L firms with non-zero financial leverage is a decreasing function of the financing risk j of classes c_j of identical firms. It expresses the risk aversion of the bondholders of said firms".

3.2.4. Value of taxable capital

Taxable capital behaves according to the financing risk as follows:
"The value G of firms' taxable funds, whether zero leverage or not, is a constant function of the financing risk j of classes c_j of identical firms. It expresses the risk indifference of the taxholder, the State".

3.3 Capital costs

These are the costs of total, equity, debt and taxable capital.

3.3.1. Weighted average cost of capital

The weighted average cost of capital takes into account all the costs of financing sources entering the capital structure, and is defined according to equations (7) and (8) as follows:
"The weighted average cost K of capital of a firm belonging to a given class c_j of financing risk j, is independent of its capital structure and is equal either to the capitalization rate of an income stream of its class, or to the arithmetic average weighted at financing values of the costs of equity, borrowed and taxable funds".
This new proposition converges with Proposition I of Modigliani and Miller (1958, pp. 268 269) when the cost t (tax rate) of taxable funds takes the value zero (t=0%). The weighted average cost of capital behaves in relation to the financing risk as follows:
"A firm's weighted average cost K of capital remains constant within a given class c_j of financing risk j, but grows as a function of the financing risk j of classes c_j of identical firms".
The weighted average cost of capital behaves in relation to the debt-to-equity ratio as follows:
"A firm's weighted average cost K of capital is a decreasing function of the debt-to-equity ratio of classes c_j of identical firms' financing risk j".

3.3.2. Cost of equity

Nil or non-zero financial leverage must be taken into account.

Cost of equity for the unleveraged firm

The cost of equity for the zero-leveraged firm is defined in equation (16) as follows:
"The cost k_U of equity of an E_U firm with zero financial leverage, is the arithmetic average weighted at financing values of the cost k_L of equity of an E_L firm with identical non-zero

financial leverage and the cost r of debt; both firms belonging to the same class c_j of financing risk j".
But it can be expressed in terms of WACC according to equation (18) as follows:
"In a given class c_j of financing risk j of identical firms, the cost k_U of equity capital of a zero-leveraged E_U firm is equal to twice the weighted average cost K of capital of the said class, minus the cost t (tax rate) of its taxable funds".
The cost of equity behaves in relation to the debt-to-equity ratio as follows:
"The cost k of equity of a firm, whether or not it is zero leverage, decreases as a function of the debt-to-equity ratio of the non-zero leverage firm of classes cj of risk j of financing identical firms".
The cost of equity behaves in relation to financing risk j as follows:
"The cost k of equity of a firm, whether it is zero leveraged or not, grows as a function of risk j of financing classes c_j of identical firms".
The cost of equity behaves in relation to the value of equity as follows:
"The cost k_U of equity capital for E_U firms with zero financial leverage and belonging to different classes c_j of financing risk j, follows the law of the goods supply function; this cost grows as a function of the level S_U of risky equity capital. The supply S_U of equity capital is an increasing function of the cost k_U of said classes".

Cost of equity and debt ratio of the leveraged firm

The cost of equity of the non-zero leverage firm is defined by equation (17) as follows:
"The cost k_L of equity of a non-zero leverage firm E_L, is equal to the cost k_U of equity of an identical zero leverage firm E_U, increased by a financial risk premium, equal to the difference between the cost k_U of equity of firm E_U and the cost r of borrowed funds of firm E_L, multiplied by the debt-to-equity ratio D to equity S_L of firm E_L; both firms belonging to the same class c_j of financing risk j".
This new proposition corresponds to Proposition II of Modigliani and Miller (1958, p. 271). But we can express this cost as a function of WACC according to equation (19) as follows:
"In a given class c_j of risk j financing identical firms, the cost k_L of equity capital of a non-zero leveraged E_L firm is equal to twice the weighted average cost K of capital of the said class, less the cost t (tax rate) of its taxable funds and, increased by two premiums, one equal to the difference between the weighted average cost K of capital and the cost r (interest rate) of its borrowed funds, multiplied by E_L firm's debt-to-equity ratio, and the other equal to the difference between the weighted average cost K of capital and the cost t (tax rate) of its taxable funds, multiplied by E_L firm's debt-to-equity ratio".
The cost of equity behaves in relation to the debt-to-equity ratio as follows:
"The cost k of equity of a firm, whether or not it has zero leverage, decreases as a function of the debt-to-equity ratio of the firm with non-zero leverage of classes c_j of risk j financing of identical firms".
The cost of equity behaves in relation to financing risk j as follows:
"The cost k of equity of a firm, whether it is zero leveraged or not, grows as a function of risk j of financing classes c_j of identical firms".
The cost of equity behaves in relation to equity capital as follows:
"The cost k_L of equity capital for E_L firms with non-zero financial leverage and belonging to different classes c_j of financing risk j, follows the law of the goods supply function; this cost grows as a function of the level S_L of risky equity capital. The S_L supply of equity capital is an increasing function of the k_L cost of the said classes".
As for the behavior of the debt-to-equity ratio in relation to financing risk, we can write:
"The debt-to-equity ratio of E_L firms with non-zero financial leverage decreases as a function of the financing risk j of c_j classes of identical firms".

"The debt-to-equity ratio of c_j classes of identical firms decreases as a function of the financing risk j of said classes".

3.3.3. Cost of debt capital

The cost of debt capital behaves in relation to borrowed funds as follows:
"The cost r of borrowed funds for E_L firms with non-zero financial leverage and belonging to different risk j financing classes c_j, follows the law of the goods demand function; this cost decreases as a function of the level of risky borrowed funds. The demand D for borrowed funds is a decreasing function of the cost r of the said classes".

3.3.4. Taxable cost of capital

The taxable cost of capital behaves in relation to taxable funds as follows:
"The cost t (tax rate) of taxable funds of firms belonging to different classes c_j of risk j of financing, follows the law of a constant function; this cost is therefore fixed but can vary by step according to the level of taxable funds. The demand G for taxable funds is a constant function of the cost t (tax rate) of said classes".

3.4. Return on capital

The return on capital (ROC) is the return on investment derived from capital, regardless of the origin of the capital. The profitability of a capital investment is defined as follows:
"A firm's investment is profitable if and only if the sum of the present values of the differences between the operating cash flows generated by the investment and the operating cash flows required by the capital, is greater than or equal to zero. This is the Differential Present Value (DPV) method".
The profitability of a capital investment is defined by another method as follows:
"A firm's investment is profitable if and only if the return R generated by the investment is greater than or equal to the weighted average cost K required by the capital. This is the Cost-Return Analysis (CRA) method".
Note that this new proposition converges with Proposition III of Modigliani and Miller (1958, p. 288). The most profitable capital investment is chosen as follows:
"In a portfolio of profitable financing and investment projects, the most profitable project is the one for which the difference between the return R generated by the capital investment and the weighted average cost K required by said capital is the highest".
ROC behaves in relation to capital structure and financing risk as follows:
"A firm's return on investment is independent of its capital structure, but grows as a function of the financing risk j of classes c_j of identical firms".
ROC of an unleveraged firm, creates a trade-off between the two stakeholders according to equation (9) as follows:
"In a zero-leveraged E_U firm, the return R on investment generates an arbitrage between the shareholders and the taxholder or the State until equilibrium is reached for the determination of the cost k_U of equity and the cost t (tax rate) of taxable funds of the said firm".
ROC of a leveraged firm creates a trade-off between the three stakeholders according to equation (10) as follows:
"In a non-zero leveraged E_L firm, the return R on investment causes an arbitrage between shareholders, bondholders and the State or taxholder, until equilibrium is reached in determining the cost k_L of equity, the cost r (interest rate) of borrowed funds and the cost t (tax rate) of taxable funds of said firm".
The value of capital investment behaves in relation to capital structure and capital value as follows:
"The value of a firm's investment is independent of the capital structure used to finance the investment from that capital and is equal to the value of that capital".

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It should also be noted that this new proposition converges with Proposition III of Modigliani and Miller (1958, p. 288). The principle of aligning the cost of taxable capital or tax rate with the cost of debt capital is as follows:
"In a given class c_j of risk j of financing identical firms, by principle of cost alignment, the cost t (tax rate) of taxable funds is less than or equal to the cost r of borrowed funds $(\boldsymbol{t \leq r})$*".*
The principle of aligning the cost of debt capital with the cost of equity capital at zero financial leverage is as follows:
"In a given class c_j of financing risk j of identical firms, by principle of cost alignment, the cost r of borrowed funds is less than or equal to the cost k_U of equity of E_U firms with zero financial leverage $(\boldsymbol{r \leq k_U})$*".*
The principle of aligning the cost of equity with zero leverage with the cost of equity with non-zero leverage is as follows:
"In a given financing risk j class c_j of identical firms, by the principle of cost alignment, the cost k_U of equity of E_U firms with zero leverage is less than or equal to the cost k_L of equity of E_L firms with non-zero leverage $(\boldsymbol{k_U \leq k_L})$*".*
In sum, by the principle of rate alignment, the corporate tax rate t aligns with the interest rate r, which in turn aligns with the zero-leveraged dividend rate k_U, which in turn aligns with the non-zero-leveraged dividend rate k_L. We therefore have $(\mathbf{t \leq r \leq k_U \leq k_L})$. Here are a few examples of numerical data to illustrate the trade-off between the firm's financial partners in determining the equilibrium cost of capital and the principle of cost alignment. In the c50 class of identical firms (E_{U50}; E_{L50}), the break-even point (minimum EBIT) is MU 16 for a total value of capital equal to MU 200 according to table n. I. The break-even rate is therefore equal to the ratio of 16 to 200, i.e. 8%. This rate represents the weighted average cost K_{50} of capital for the said class and will be shared between the stakeholders. The arbitrage sharing process of this return on capital takes place at the level of the E_{U50} firm with zero financial leverage, by applying equation (9), in order to determine the tax rate and the cost of equity. Thus equation (9) becomes:

$$\mathbf{8}\% = \frac{\mathbf{k_U}}{\mathbf{2}} + \frac{\mathbf{t}}{\mathbf{2}} \qquad (\mathbf{9})$$

This equation has an infinite number of solutions. By restriction for convenience, the possible solutions (t; k_{U50}) of natural numbers of this equation respecting the alignment of the tax rate t with the cost r_{50} equal to 8% of the financial debts of this class according to table n. I, are: (1%; 15%); (2%; 14%); (3%; 13%); (4%; 12%); (5%; 11%); (6%; 10%); **(7%; 9%)**; (8%; 8%).
At equilibrium after arbitrage, the solution (t; k_{U50}) is **(7%; 9%)**.
The tax rate t is **t = 7%** and the cost k_U of equity at zero leverage is $\mathbf{k_{U50}}$ **= 9%**. It follows that the cost of equity k_{L50} at firm E_{L50} level with non-zero financial leverage is determined by applying equation (17). Thus, equation (17) becomes:

$$\mathbf{k_L} = \mathbf{9}\% + (\mathbf{9}\% - \mathbf{8}\%)\frac{\mathbf{50}}{\mathbf{50}} \qquad (\mathbf{17})$$

The k_{L50} cost of equity with non-zero leverage is $\mathbf{k_{L50}}$ **= 10%**. We can write at the level of the c_{50} class: $(\mathbf{t} = \mathbf{7}\% \leq \mathbf{r_{50}} = \mathbf{8}\% \leq \mathbf{k_{U50}} = \mathbf{9}\% \leq \mathbf{k_{L50}} = \mathbf{10}\%)$. By deduction, the principle of cost alignment at the level of classes c_0, c_{25}, c_{75} and c_{100} is verified as follows:
For c_0 class: $(\mathbf{t} = \mathbf{7}\% \leq \mathbf{r_0} = \mathbf{7}\% \leq \mathbf{k_{U0}} = \mathbf{7}\% \leq \mathbf{k_{L0}} = \mathbf{8}\%)$.
For c_{25} class: $(\mathbf{t} = \mathbf{7}\% \leq \mathbf{r_{25}} = \mathbf{7{,}5}\% \leq \mathbf{k_{U25}} = \mathbf{7{,}88}\% \leq \mathbf{k_{L25}} = \mathbf{9}\%)$.
For c_{75} class: $(\mathbf{t} = \mathbf{7}\% \leq \mathbf{r_{75}} = \mathbf{8{,}5}\% \leq \mathbf{k_{U75}} = \mathbf{10{,}38}\% \leq \mathbf{k_{L75}} = \mathbf{11}\%)$.
For c_{100} class: $(\mathbf{t} = \mathbf{7}\% \leq \mathbf{r_{100}} = \mathbf{9}\% \leq \mathbf{k_{U100}} = \mathbf{12}\% \leq \mathbf{k_{L100}} = \mathbf{12}\%)$.
In short, in a firm with zero financial leverage, the determination of the cost of equity capital depends on the return on capital and the trade-off between shareholders and the “taxholder” or the State for the distribution of the return on capital in equilibrium. However, in a firm with non-zero financial leverage, the determination of the cost of equity depends not only on the

return on capital but also on the arbitrage between shareholders, bondholders and the “taxholder” or the State, until equilibrium is reached for the equilibrium distribution of the return on capital.

3.5. Illustration by tables and graphs

Tables II, III and IV show the structure, values, costs and minimum return on capital for 101 pairs of identical firms (E_U; E_L). It should be noted that the pair of identical firms from the case study, presented in Table I, is in the c_{50} class of risk j equal to 50 of financing. According to the case study presented in table n. I, the two identical firms bear different corporate income tax burdens; this constitutes a violation of the principle of identical firms belonging to the same given class of financing risk.

Table n. II: Capital Structure of 36 pairs of identical firms (E_U; E_L)

Class c_j	Non-indebted firm E_U						Indebted firm E_L							
	Capital Values			*Costs of Capital*			*Capital Values*				*Costs of Capital*			
	Equity	Tax	TOTAL	Equity	Tax	WACC	Equity	Debt	Tax	TOTAL	Equity	Debt	Tax	WACC
	S_U	G_U	V_U	k_U(%)	t(%)	K_U(%)	S_L	D	G_L	V_L	k_L(%)	r(%)	t(%)	K_L(%)
c0	100	100	200	7	7	*7*	0	100	100	200	8	7	7	*7*
c1	100	100	200	7,03	7	*7,02*	1	99	100	200	8,04	7,02	7	*7,02*
c2	100	100	200	7,06	7	*7,03*	2	98	100	200	8,08	7,04	7	*7,03*
c3	100	100	200	7,09	7	*7,05*	3	97	100	200	8,12	7,06	7	*7,05*
c4	100	100	200	7,12	7	*7,06*	4	96	100	200	8,16	7,08	7	*7,06*
c5	100	100	200	7,16	7	*7,08*	5	95	100	200	8,20	7,1	7	*7,08*
c6	100	100	200	7,19	7	*7,09*	6	94	100	200	8,24	7,12	7	*7,09*
c7	100	100	200	7,22	7	*7,11*	7	93	100	200	8,28	7,14	7	*7,11*
c8	100	100	200	7,25	7	*7,13*	8	92	100	200	8,32	7,16	7	*7,13*
c9	100	100	200	7,29	7	*7,14*	9	91	100	200	8,36	7,18	7	*7,14*
c10	100	100	200	7,32	7	*7,16*	10	90	100	200	8,40	7,2	7	*7,16*
c11	100	100	200	7,35	7	*7,18*	11	89	100	200	8,44	7,22	7	*7,18*
c12	100	100	200	7,39	7	*7,19*	12	88	100	200	8,48	7,24	7	*7,19*
c13	100	100	200	7,42	7	*7,21*	13	87	100	200	8,52	7,26	7	*7,21*
c14	100	100	200	7,46	7	*7,23*	14	86	100	200	8,56	7,28	7	*7,23*
c15	100	100	200	7,50	7	*7,25*	15	85	100	200	8,60	7,3	7	*7,25*
c16	100	100	200	7,53	7	*7,27*	16	84	100	200	8,64	7,32	7	*7,27*
c17	100	100	200	7,57	7	*7,28*	17	83	100	200	8,68	7,34	7	*7,28*
c18	100	100	200	7,60	7	*7,30*	18	82	100	200	8,72	7,36	7	*7,30*
c19	100	100	200	7,64	7	*7,32*	19	81	100	200	8,76	7,38	7	*7,32*
c20	100	100	200	7,68	7	*7,34*	20	80	100	200	8,80	7,4	7	*7,34*
c21	100	100	200	7,72	7	*7,36*	21	79	100	200	8,84	7,42	7	*7,36*
c22	100	100	200	7,76	7	*7,38*	22	78	100	200	8,88	7,44	7	*7,38*
c23	100	100	200	7,80	7	*7,40*	23	77	100	200	8,92	7,46	7	*7,40*
c24	100	100	200	7,84	7	*7,42*	24	76	100	200	8,96	7,48	7	*7,42*
c25	100	100	200	7,88	7	*7,44*	25	75	100	200	9,00	7,5	7	*7,44*
c26	100	100	200	7,92	7	*7,46*	26	74	100	200	9,04	7,52	7	*7,46*
c27	100	100	200	7,96	7	*7,48*	27	73	100	200	9,08	7,54	7	*7,48*

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Volume 5, Issue 3 (2024), pp. 284-311.

IJAFAME
International Journal of Accounting, Finance, Auditing, Management & Economics

c28	100	100	200	8,00	7	*7,50*	28	72	100	200	9,12	7,56	7	*7,50*
c29	100	100	200	8,04	7	*7,52*	29	71	100	200	9,16	7,58	7	*7,52*
c30	100	100	200	8,08	7	*7,54*	30	70	100	200	9,20	7,6	7	*7,54*
c31	100	100	200	8,12	7	*7,56*	31	69	100	200	9,24	7,62	7	*7,56*
c32	100	100	200	8,16	7	*7,58*	32	68	100	200	9,28	7,64	7	*7,58*
c33	100	100	200	8,21	7	*7,60*	33	67	100	200	9,32	7,66	7	*7,60*
c34	100	100	200	8,25	7	*7,63*	34	66	100	200	9,36	7,68	7	*7,63*
c35	100	100	200	8,30	7	*7,65*	35	65	100	200	9,40	7,7	7	*7,65*

Source: Author based on table n. I

Table n. III: Capital Structure of 35 pairs of identical firms (EU; EL)

Class	Non-indebted firm E_U						Indebted firm E_L							
	Capital Values			*Costs of Capital*			*Capital Values*				*Costs of Capital*			
c_j	Equity	Tax	TOTAL	Equity	Tax	WACC	Equity	Debt	Tax	TOTAL	Equity	Debt	Tax	WACC
	S_U	G_U	V_U	k_U(%)	t(%)	K_U(%)	S_L	D	G_L	V_L	k_L(%)	r(%)	t(%)	K_L(%)
c36	100	100	200	8,34	7	*7,67*	36	64	100	200	9,44	7,72	7	*7,67*
c37	100	100	200	8,38	7	*7,69*	37	63	100	200	9,48	7,74	7	*7,69*
c38	100	100	200	8,43	7	*7,71*	38	62	100	200	9,52	7,76	7	*7,71*
c39	100	100	200	8,47	7	*7,74*	39	61	100	200	9,56	7,78	7	*7,74*
c40	100	100	200	8,52	7	*7,76*	40	60	100	200	9,6	7,8	7	*7,76*
c41	100	100	200	8,57	7	*7,78*	41	59	100	200	9,64	7,82	7	*7,78*
c42	100	100	200	8,61	7	*7,81*	42	58	100	200	9,68	7,84	7	*7,81*
c43	100	100	200	8,66	7	*7,83*	43	57	100	200	9,72	7,86	7	*7,83*
c44	100	100	200	8,71	7	*7,85*	44	56	100	200	9,76	7,88	7	*7,85*
c45	100	100	200	8,76	7	*7,88*	45	55	100	200	9,8	7,9	7	*7,88*
c46	100	100	200	8,80	7	*7,90*	46	54	100	200	9,84	7,92	7	*7,90*
c47	100	100	200	8,85	7	*7,93*	47	53	100	200	9,88	7,94	7	*7,93*
c48	100	100	200	8,90	7	*7,95*	48	52	100	200	9,92	7,96	7	*7,95*
c49	100	100	200	8,95	7	*7,98*	49	51	100	200	9,96	7,98	7	*7,98*
c50	100	100	200	9	7	*8*	50	50	100	200	10	8	7	*8*
c51	100	100	200	9,05	7	*8,03*	51	49	100	200	10,04	8,02	7	*8,03*
c52	100	100	200	9,10	7	*8,05*	52	48	100	200	10,08	8,04	7	*8,06*
c53	100	100	200	9,15	7	*8,08*	53	47	100	200	10,12	8,06	7	*8,08*
c54	100	100	200	9,20	7	*8,10*	54	46	100	200	10,16	8,08	7	*8,11*
c55	100	100	200	9,26	7	*8,13*	55	45	100	200	10,2	8,1	7	*8,13*
c56	100	100	200	9,32	7	*8,16*	56	44	100	200	10,24	8,12	7	*8,16*
c57	100	100	200	9,37	7	*8,18*	57	43	100	200	10,28	8,14	7	*8,18*
c58	100	100	200	9,42	7	*8,21*	58	42	100	200	10,32	8,16	7	*8,21*
c59	100	100	200	9,47	7	*8,24*	59	41	100	200	10,36	8,18	7	*8,24*
c60	100	100	200	9,53	7	*8,26*	60	40	100	200	10,4	8,2	7	*8,26*
c61	100	100	200	9,58	7	*8,29*	61	39	100	200	10,44	8,22	7	*8,29*
c62	100	100	200	9,64	7	*8,32*	62	38	100	200	10,48	8,24	7	*8,32*
c63	100	100	200	9,69	7	*8,35*	63	37	100	200	10,52	8,26	7	*8,35*

c64	100	100	200	9,75	7	*8,37*	64	36	100	200	10,56	8,28	7	*8,37*
c65	100	100	200	9,80	7	*8,40*	65	35	100	200	10,6	8,3	7	*8,40*
c66	100	100	200	9,86	7	*8,43*	66	34	100	200	10,64	8,32	7	*8,43*
c67	100	100	200	9,91	7	*8,46*	67	33	100	200	10,68	8,34	7	*8,46*
c68	100	100	200	9,97	7	*8,49*	68	32	100	200	10,72	8,36	7	*8,49*
c69	100	100	200	10,03	7	*8,51*	69	31	100	200	10,76	8,38	7	*8,51*
c70	100	100	200	10,09	7	*8,54*	70	30	100	200	10,8	8,4	7	*8,54*

Source: Author based on table n. I

Table n. IV: Capital Structure of 30 pairs of identical firms (EU; EL)

Class c_j	Non-indebted firm E_U						Indebted firm E_L							
	Capital Values			*Costs of Capital*			*Capital Values*				*Costs of Capital*			
	Equity	Tax	TOTAL	Equity	Tax	WACC	Equity	Debt	Tax	TOTAL	Equity	Debt	Tax	WACC[4]
	S_U	G_U	V_U	k_U(%)	t(%)	K_U(%)	S_L	D	G_L	V_L	k_L(%)	r(%)	t(%)	K_L(%)
c71	100	100	200	10,14	7	*8,57*	71	29	100	200	10,84	8,42	7	*8,57*
c72	100	100	200	10,20	7	*8,60*	72	28	100	200	10,88	8,44	7	*8,60*
c73	100	100	200	10,26	7	*8,63*	73	27	100	200	10,92	8,46	7	*8,63*
c74	100	100	200	10,32	7	*8,66*	74	26	100	200	10,96	8,48	7	*8,66*
c75	100	100	200	10,38	7	*8,69*	75	25	100	200	11	8,5	7	*8,69*
c76	100	100	200	10,44	7	*8,72*	76	24	100	200	11,04	8,52	7	*8,72*
c77	100	100	200	10,50	7	*8,75*	77	23	100	200	11,08	8,54	7	*8,75*
c78	100	100	200	10,56	7	*8,78*	78	22	100	200	11,12	8,56	7	*8,78*
c79	100	100	200	10,62	7	*8,81*	79	21	100	200	11,16	8,58	7	*8,81*
c80	100	100	200	10,68	7	*8,84*	80	20	100	200	11,2	8,6	7	*8,84*
c81	100	100	200	10,75	7	*8,87*	81	19	100	200	11,24	8,62	7	*8,87*
c82	100	100	200	10,81	7	*8,90*	82	18	100	200	11,28	8,64	7	*8,90*
c83	100	100	200	10,87	7	*8,94*	83	17	100	200	11,32	8,66	7	*8,94*
c84	100	100	200	10,93	7	*8,97*	84	16	100	200	11,36	8,68	7	*8,97*
c85	100	100	200	11,00	7	*9,00*	85	15	100	200	11,4	8,7	7	*9,00*
c86	100	100	200	11,06	7	*9,03*	86	14	100	200	11,44	8,72	7	*9,03*
c87	100	100	200	11,13	7	*9,06*	87	13	100	200	11,48	8,74	7	*9,06*
c88	100	100	200	11,19	7	*9,10*	88	12	100	200	11,52	8,76	7	*9,10*
c89	100	100	200	11,26	7	*9,13*	89	11	100	200	11,56	8,78	7	*9,13*
c90	100	100	200	11,32	7	*9,16*	90	10	100	200	11,6	8,8	7	*9,16*
c91	100	100	200	11,39	7	*9,19*	91	9	100	200	11,64	8,82	7	*9,19*
c92	100	100	200	11,45	7	*9,23*	92	8	100	200	11,68	8,84	7	*9,23*
c93	100	100	200	11,52	7	*9,26*	93	7	100	200	11,72	8,86	7	*9,26*
c94	100	100	200	11,59	7	*9,29*	94	6	100	200	11,76	8,88	7	*9,29*
c95	100	100	200	11,66	7	*9,33*	95	5	100	200	11,8	8,9	7	*9,33*
c96	100	100	200	11,72	7	*9,36*	96	4	100	200	11,84	8,92	7	*9,36*
c97	100	100	200	11,79	7	*9,40*	97	3	100	200	11,88	8,94	7	*9,40*
c98	100	100	200	11,86	7	*9,43*	98	2	100	200	11,92	8,96	7	*9,43*

[4] WACC: Weighted Average Cost of Capital

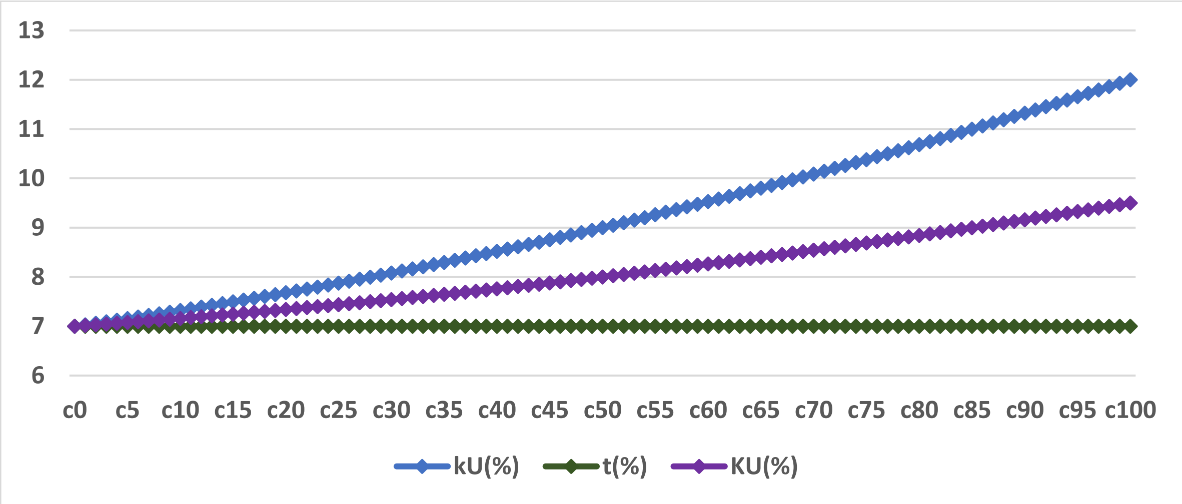
c99	**100**	**100**	**200**	**11,93**	**7**	***9,47***	**99**	**1**	**100**	**200**	**11,96**	**8,98**	**7**	***9,47***
c100	**100**	**100**	**200**	**12**	**7**	***9,5***	**100**	**0**	**100**	**200**	**12**	**9**	**7**	***9,5***

Source: Author based on table n. I

In the interests of tax fairness, two identical firms of the same financing risk class are expected to bear the same amount of corporate tax. It has to be said that all equations from (3) to (21) and research hypotheses H1, H2, H3 and H4 are verified according to tables n.II, III and IV. In addition, graphs I to VI clearly illustrate the results obtained.

Graph n. I presents the cost $\mathbf{k_U}$ of equity, the corporate tax rate **t** on capital and the weighted average cost $\mathbf{K_U}$ of capital for 101 E_U firms with zero financial leverage, belonging to different classes c_j of financing risk.

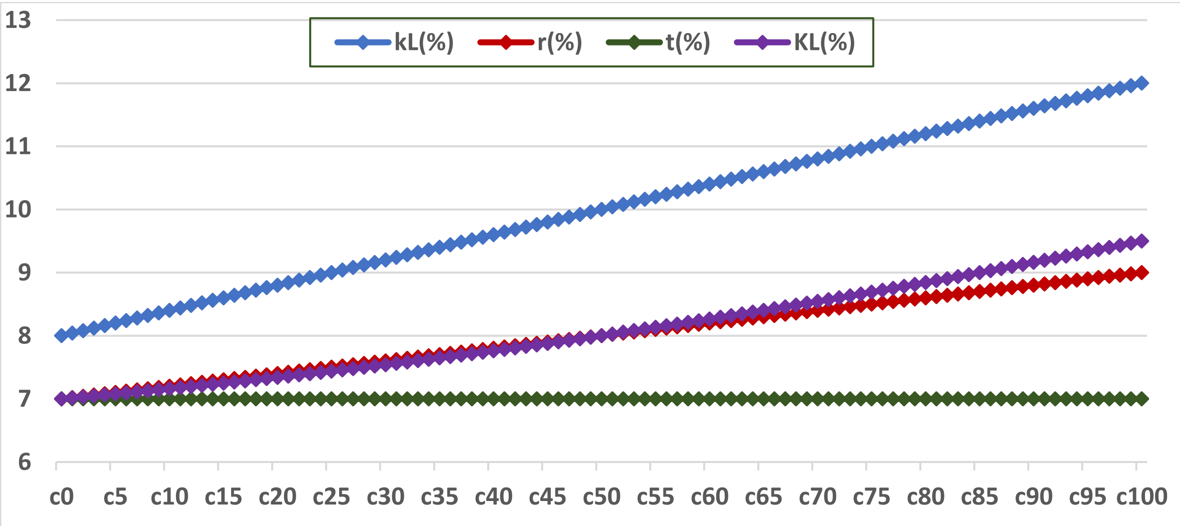
Graph n. I: Cost curves kU, t and KU of capital at zero financial leverage



Source: Author using Excel 2021

Graph n. II presents the debt interest rate **r**, the equity dividend rate $\mathbf{k_L}$, the corporate tax rate **t** on capital and the weighted average cost of capital $\mathbf{K_L}$ of the 101 E_L firms with non-zero financial leverage, belonging to different c_j classes of financing risk.

Graph n. II: Cost curves kL, r, t and KL of capital with non-zero financial leverage

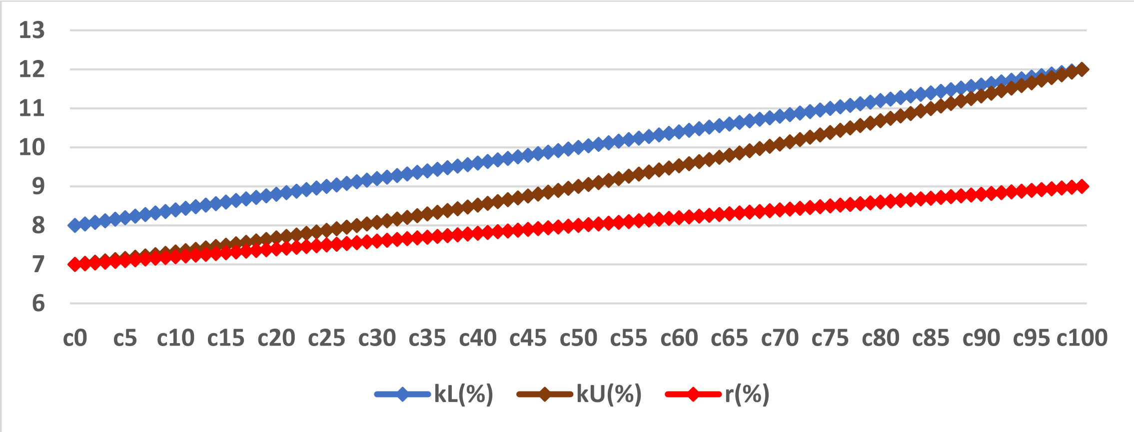


Source: Author using Excel 2021

Graph n. III presents the curves of the financial leverage effect, that is to say the relationship between the dividend rate $\mathbf{k_L}$ of an identical firm with non-zero leverage, the dividend rate $\mathbf{k_U}$

of an identical firm with zero financial leverage and the interest rate **r**; the two firms belonging to the same financing risk class c_j; for 101 classes c_j of financing risk.

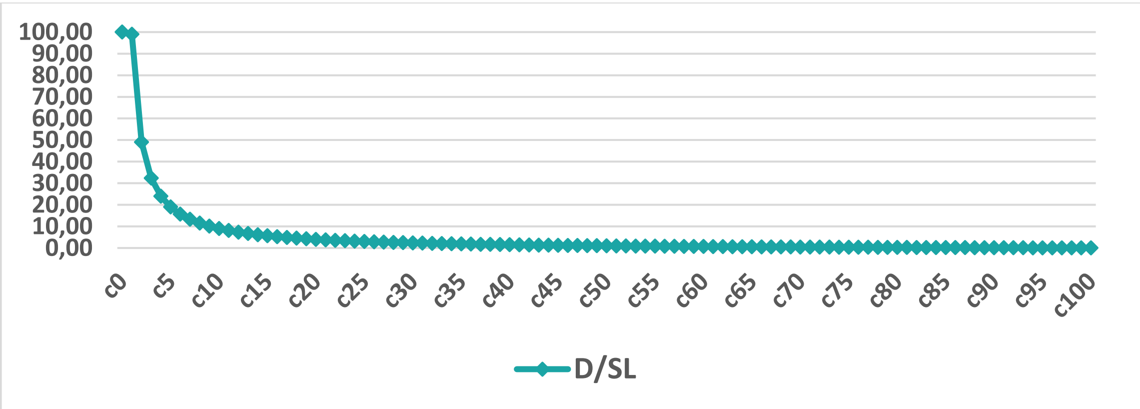
Graph n. III: Cost curves kL, r and kU of capital (financial leverage effect)



Source: author using Excel 2021

Graph n. IV presents the non-zero financial leverage curve $\mathbf{D/S_{Lj}}$ of the financing risk classes c_j.

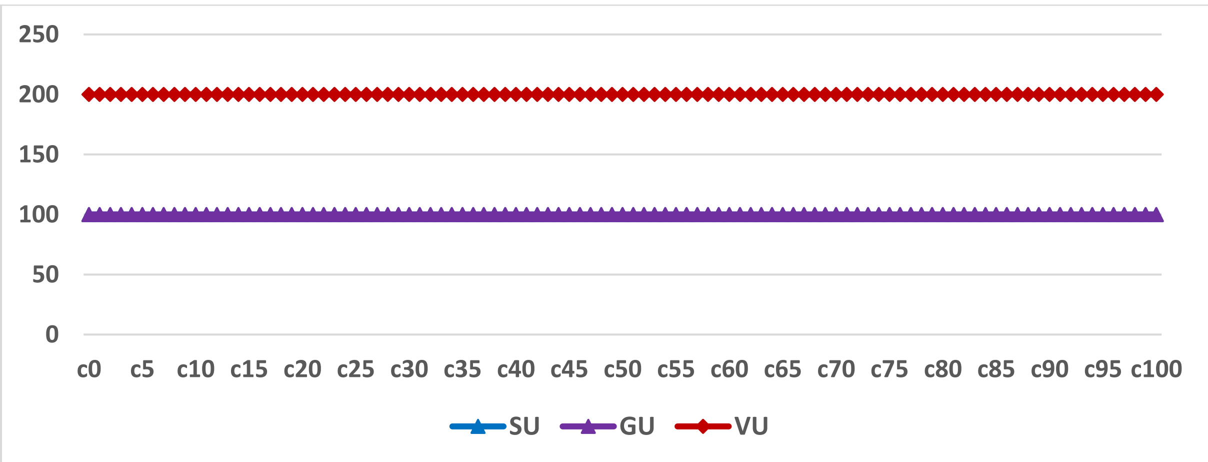
Graph n. IV: Non-zero financial leverage curve



Source: Author using Excel 2021

Graph n. V shows the curves of the values $\mathbf{S_U}$ of equity capital, $\mathbf{G_U}$ of taxable capital and $\mathbf{V_U}$ of capital for 101 E_U identical firms with zero leverage belonging to different classes cj of financing risk.

Graph n. V: Curves of SU, GU and VU values of capital with zero financial leverage



Source: Author using Excel 2021

ISSN: 2658-8455
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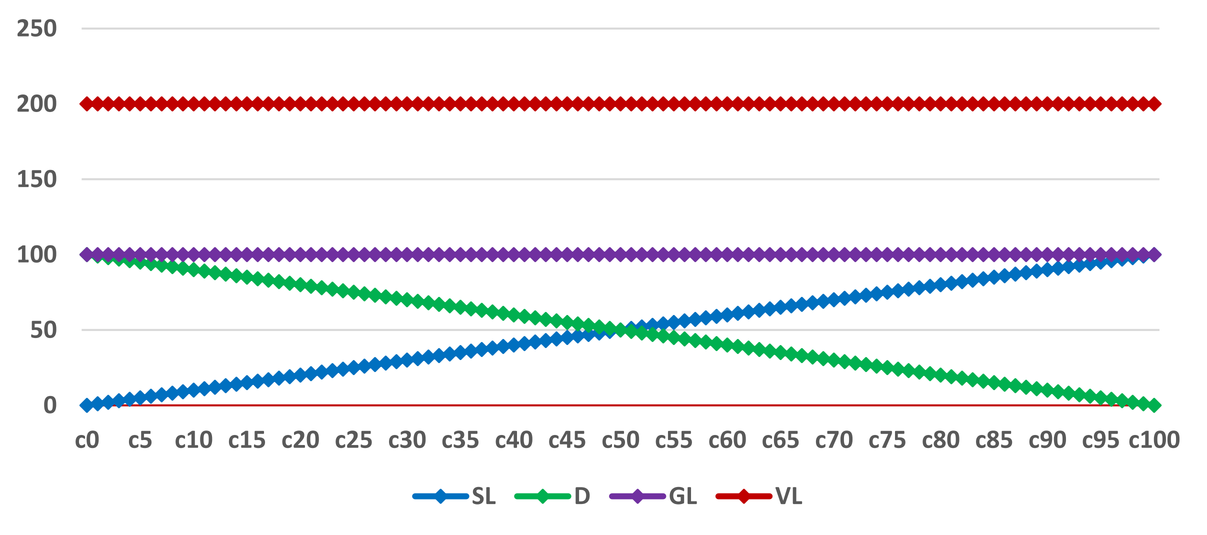
Graph n. VI presents the curves of the values $\mathbf{S_L}$ of equity capital, **D** of debt capital, $\mathbf{G_L}$ of taxable capital and $\mathbf{V_L}$ of capital of 101 E_L identical firms with non-zero leverage belonging to different classes c_j of financing risk.

Graph n. V: Curves of SL, D, GL and VL values of capital with non-zero financial leverage



Source: Author using Excel 2021

In short, the results confirm Modigliani and Miller (1958)'s theory of irrelevance in the presence of CIT, but contradict Modigliani and Miller (1963)'s theory of relevance, TOT theory, POT theory and agency theory. In the presence of CIT, capital structure has no effect on capital value, cost of capital or return on capital. The tax gain resulting from debt interest deduction in computing corporate income tax is merely an unpremeditated misappropriation of income from firms with zero financial leverage to firms with non-zero financial leverage (Agossadou 2023).

4- Conclusion

The financial integration of corporate taxation has made it possible to define new propositions in corporate finance. The results obtained will certainly disabuse the victims of the financial illusion and rehabilitate Modigliani and Miller (1958) in their basic version in a world where the contradictions of the most recent studies tend to the conclusion that there is in this case an optimal capital structure. Miller (1977: p. 262) was right to say: "I would argue that even in a world where interest payments are fully deductible in computing corporation tax, the value of the firm, in equilibrium will always be independent of its capital structure". Cobbaut (1997) was at pains to point out that the basic theory of Modigliani and Miller (1958) nevertheless remains the fundamental frame of reference from which it must be demonstrated, in a specific situation, that there is a real interest in departing. The thesis of the neutrality of the capital structure developed by Modigliani and Miller in 1958, which had been questionable since the 1960s due to the inclusion of CIT, has now resurfaced in an economy where competition reigns supreme.

The results called into question the main tax theories of capital structure (Modigliani and Miller (1963)'s relevance theory, trade-off theory, signaling theory, pecking order theory and agency cost theory). The results also unmasked a third global source of financing for the firm, the cost of which is the corporate tax. CIT has no effect on capital structure, capital value, weighted average cost of capital (WACC) or return on capital (ROC). Furthermore, in the presence of CIT, the capital structure has no effect on capital value, WACC and ROC. With regard to capital market financing risk, the results showed that shareholders have a taste for

risk, bondholders are risk-averse and the taxholder (the State) is indifferent to risk. Arbitrage on the capital markets has enabled the tax rate to align with the interest rate, which in turn aligns with the zero-leverage dividend rate, which in turn aligns with the non-zero leverage dividend rate.
What now remains to be done is a tax reform consisting of substituting the system of corporate capital taxation for the system of corporate income taxation, and applying these new proposals of the financial integration theory of corporate taxation.

References

(1). Agossadou, S. T. M. D. C. (2023). Incidence of Debt Interest Deduction in Computing Corporate Income Tax-CIT. *Revue Française d'Economie et de Gestion*, *4*(12), Article 12. https://doi.org/10.5281/zenodo.10429196
(2). Akerlof, G. A. (1970). The Market for "Lemons": Quality Uncertainty and the Market Mechanism*. *The Quarterly Journal of Economics*, *84*(3), 488–500. https://doi.org/10.2307/1879431
(3). Asquith, P., & Mullins, D. W. (1983). The Impact of Initiating Dividend Payments on Shareholders' Wealth. *The Journal of Business*, *56*(1), 77–96.
(4). Auerbach, A. (2002). *Taxation and corporate financial policy* (pp. 1251–1292) [Handbook of Public Economics]. Elsevier. https://econpapers.repec.org/bookchap/eeepubchp/3-19.htm
(5). Baker, M., & Wurgler, J. (2002). Market Timing and Capital Structure. *The Journal of Finance*, *57*(1), 1–32. https://doi.org/10.1111/1540-6261.00414
(6). Barclay, M. J., & Smith, C. W. (2005). The Capital Structure Puzzle: The Evidence Revisited. *Journal of Applied Corporate Finance*, *17*(1), 8–17.
(7). Barton, S. L., & Gordon, P. J. (1988). Corporate Strategy and Capital Structure. *Strategic Management Journal*, *9*(6), 623–632.
(8). Baxter, N. D. (1967). Leverage, Risk of Ruin and the Cost of Capital*. *The Journal of Finance*, *22*(3), 395–403. https://doi.org/10.1111/j.1540-6261.1967.tb02975.x
(9). Berger, A., & Bonaccorsi di Patti, E. (2006). Capital structure and firm performance: A new approach to testing agency theory and an application to the banking industry. *Journal of Banking & Finance*, *30*(4), 1065–1102.
(10). Black, F., & Scholes, M. (1973). The Pricing of Options and Corporate Liabilities. *Journal of Political Economy*, *81*(3), 637–654.
(11). Bradley, M., Jarrell, G. A., & Kim, E. H. (1984). On the Existence of an Optimal Capital Structure: Theory and Evidence. *The Journal of Finance*, *39*(3), 857–878. https://doi.org/10.2307/2327950
(12). Brennan, M. J., & Schwartz, E. S. (1984). Optimal Financial Policy and Firm Valuation. *The Journal of Finance*, *39*(3), 593–607. https://doi.org/10.2307/2327917
(13). Brounen, D., de Jong, A., & Koedijk, K. (2006). Capital structure policies in Europe: Survey evidence. *Journal of Banking & Finance*, *30*(5), 1409–1442.
(14). Carpentier, C. (2006). The valuation effects of long-term changes in capital structure. *International Journal of Managerial Finance*, *2*(1), 4–18. https://doi.org/10.1108/17439130610646144
(15). Chakraborty, I. (2010). Financial Development and Economic Growth in India An Analysis of the Post-reform Period. *South Asia Economic Journal*, *11*, 287–308. https://doi.org/10.1177/139156141001100206
(16). Charreaux, G. (1997). *Le gouvernement des entreprises : Théories et faits*. Economica, DL 1997.
(17). Cobbaut, R. (1997). Politique de dividende. In *Encyclopédie de gestion* (2è éd., p. 2304 2324.). Economica.

ISSN: 2658-8455
Volume 5, Issue 3 (2024), pp. 284-311.

(18). Colot, O., & Croquet, M. (2007). Les déterminants de la structure financière des entreprises belges. *Reflets et perspectives de la vie economique*, *2*, 177–198.
(19). Croquet, M., Heldenbergh, A., & Pozniak, L. (2013). Profils de financement des grandes entreprises. Le cas de la Belgique. *La Revue des Sciences de Gestion*, *259–260*(1–2), 111–118. https://doi.org/10.3917/rsg.259.0111
(20). DeAngelo, H. (2022). The Capital Structure Puzzle: What Are We Missing? *Journal of Financial and Quantitative Analysis*, *57*(2), 413–454. https://doi.org/10.1017/S002210902100079X
(21). DeAngelo, H., & Masulis, R. W. (1980). Optimal capital structure under corporate and personal taxation. *Journal of Financial Economics*, *8*(1), 3–29. https://doi.org/10.1016/0304-405X(80)90019-7
(22). Desai, M. A., Dyck, A., & Zingales, L. (2007). Theft and taxes. *Journal of Financial Economics*, *84*(3), 591–623. https://doi.org/10.1016/j.jfineco.2006.05.005
(23). Durand, D. (1952). *Costs of Debt and Equity Funds for Business: Trends and Problems of Measurement* (pp. 215–262) [NBER Chapters]. National Bureau of Economic Research, Inc. https://econpapers.repec.org/bookchap/nbrnberch/4790.htm
(24). Fama, E., & French, K. (2000). Forecasting Profitability and Earnings. *The Journal of Business*, *73*(2), 161–175.
(25). Flannery, M., & Rangan, K. P. (2006). Partial adjustment toward target capital structures. *Journal of Financial Economics*, *79*(3), 469–506.
(26). Frank, M. Z., & Goyal, V. K. (2003). Testing the pecking order theory of capital structure. *Journal of Financial Economics*, *67*(2), 217–248. https://doi.org/10.1016/S0304-405X(02)00252-0
(27). Frank, M. Z., & Goyal, V. K. (2009). Capital Structure Decisions: Which Factors Are Reliably Important? *Financial Management*, *38*(1), 1–37.
(28). Graham, J. R. (1996). Debt and the marginal tax rate. *Journal of Financial Economics*, *41*(1), 41–73.
(29). Graham, J. R. (2006). A Review of Taxes and Corporate Finance. *Foundations and Trends® in Finance*, *1*(7), 573–691. https://doi.org/10.1561/0500000010
(30). Graham, J. R., & Harvey, C. R. (2001). The theory and practice of corporate finance: Evidence from the field. *Journal of Financial Economics*, *60*(2), 187–243. https://doi.org/10.1016/S0304-405X(01)00044-7
(31). Graham, J. R., & Tucker, A. L. (2006). Tax shelters and corporate debt policy. *Journal of Financial Economics*, *81*(3), 563–594.
(32). Greenwald, B. C., Stiglitz, J., & Weiss, A. (1984). *Informational Imperfections in the Capital Market and Macro-Economic Fluctuations* (NBER Working Paper 1335). National Bureau of Economic Research, Inc. https://econpapers.repec.org/paper/nbrnberwo/1335.htm
(33). Gruber, M. J., & Warner, J. B. (1977). Bankruptcy Costs: Some Evidence. *The Journal of Finance*, *32*(2), 337–347. https://doi.org/10.1111/j.1540-6261.1977.tb03274.x
(34). Harris, M., & Raviv, A. (1990). Capital Structure and the Informational Role of Debt. *The Journal of Finance*, *45*(2), 321–349. https://doi.org/10.1111/j.1540-6261.1990.tb03693.x
(35). Harvey, C., Lins, K., & Roper, A. H. (2004). The effect of capital structure when expected agency costs are extreme. *Journal of Financial Economics*, *74*(1), 3–30.
(36). Helwege, J., & Liang, N. (1996). Is there a pecking order? Evidence from a panel of IPO firms. *Journal of Financial Economics*, *40*(3), 429–458.
(37). Hermalin, B. E., & Weisbach, M. S. (1998). Endogenously Chosen Boards of Directors and Their Monitoring of the CEO. *The American Economic Review*, *88*(1), 96–118.
(38). Hicks, J. (1975). Revival of Political Economy: The Old and the New. *Economic*

Record, *51*(3), 365–367. https://doi.org/10.1111/j.1475-4932.1975.tb00263.x
(39). Horne, J. C. V. (1974). *Gestion et politique financière*. Dunod.
(40). Hossain, M. S. (2021). A revisit of capital structure puzzle: Global evidence and analysis. *International Review of Economics & Finance*, *75*, 657–678. https://doi.org/10.1016/j.iref.2021.05.001
(41). Hubbard, R. G. (1998). Capital-Market Imperfections and Investment. *Journal of Economic Literature*, *36*(1), 193–225.
(42). Jensen, M. C. (1986). Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers. *The American Economic Review*, *76*(2), 323–329.
(43). Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, *3*(4), 305–360. https://doi.org/10.1016/0304-405X(76)90026-X
(44). Kane, A., Marcus, A. J., & McDONALD, R. L. (1984). How Big is the Tax Advantage to Debt? *The Journal of Finance*, *39*(3), 841–853. https://doi.org/10.1111/j.1540-6261.1984.tb03678.x
(45). Kim, E. H. (1978). A Mean-Variance Theory of Optimal Capital Structure and Corporate Debt Capacity. *The Journal of Finance*, *33*(1), 45–63. https://doi.org/10.2307/2326349
(46). Kim, W. S., & Sorensen, E. H. (1986). Evidence on the Impact of the Agency Costs of Debt on Corporate Debt Policy. *The Journal of Financial and Quantitative Analysis*, *21*(2), 131–144. https://doi.org/10.2307/2330733
(47). Kraus, A., & Litzenberger, R. H. (1973). A State-Preference Model of Optimal Financial Leverage. *The Journal of Finance*, *28*(4), 911–922. https://doi.org/10.1111/j.1540-6261.1973.tb01415.x
(48). La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. W. (1998). Law and Finance. *Journal of Political Economy*, *106*(6), 1113–1155. https://doi.org/10.1086/250042
(49). Leary, M. T., & Roberts, M. (2010). The pecking order, debt capacity, and information asymmetry. *Journal of Financial Economics*, *95*(3), 332–355.
(50). Leland, H. E., & Pyle, D. H. (1977). Informational Asymmetries, Financial Structure, and Financial Intermediation. *The Journal of Finance*, *32*(2), 371–387. https://doi.org/10.2307/2326770
(51). Lubatkin, M., & Chatterjee, S. (1994). Extending Modern Portfolio Theory into the Domain of Corporate Diversification: Does It Apply? *The Academy of Management Journal*, *37*(1), 109–136. https://doi.org/10.2307/256772
(52). MacKie-Mason, J. K. (1990). Do Taxes Affect Corporate Financing Decisions? *The Journal of Finance*, *45*(5), 1471–1493. https://doi.org/10.2307/2328746
(53). Masulis, R. W., & Korwar, A. N. (1986). Seasoned equity offerings: An empirical investigation. *Journal of Financial Economics*, *15*(1), 91–118. https://doi.org/10.1016/0304-405X(86)90051-6
(54). Mikkelson, W. H., & Partch, M. M. (1986). Valuation effects of security offerings and the issuance process. *Journal of Financial Economics*, *15*(1), 31–60. https://doi.org/10.1016/0304-405X(86)90049-8
(55). Miller, M. H. (1977). Debt and Taxes*. *The Journal of Finance*, *32*(2), 261–275. https://doi.org/10.1111/j.1540-6261.1977.tb03267.x
(56). Miller, M. H., & Modigliani, F. (1966). Some Estimates of the Cost of Capital to the Electric Utility Industry, 1954-57. *The American Economic Review*, *56*(3), 333–391.
(57). Miller, M., & Modigliani, F. (1961). Dividend Policy, Growth, and the Valuation of Shares. *The Journal of Business*, *34*. https://econpapers.repec.org/article/ucpjnlbus/v_3a34_3ay_3a1961_3ap_3a411.htm

(58). Modigliani, F., & Miller, M. H. (1958). The Cost of Capital, Corporation Finance and the Theory of Investment. *The American Economic Review*, *48*(3), 261–297.
(59). Modigliani, F., & Miller, M. H. (1963). Corporate Income Taxes and the Cost of Capital: A Correction. *The American Economic Review*, *53*(3), 433–443.
(60). Morck, R., Shleifer, A., & Vishny, R. W. (1988). Management ownership and market valuation: An empirical analysis. *Journal of Financial Economics*, *20*, 293–315. https://doi.org/10.1016/0304-405X(88)90048-7
(61). Myers, S. C. (1977). Determinants of corporate borrowing. *Journal of Financial Economics*, *5*(2), 147–175.
(62). Myers, S. C. (1984). The Capital Structure Puzzle. *The Journal of Finance*, *39*(3), 574–592. https://doi.org/10.1111/j.1540-6261.1984.tb03646.x
(63). Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*, *13*(2), 187–221. https://doi.org/10.1016/0304-405X(84)90023-0
(64). Ozkan, A. (2001). Determinants of Capital Structure and Adjustment to Long Run Target: Evidence from UK Company Panel Data. *Journal of Business Finance & Accounting*, *28*(1–2), 175–198. https://doi.org/10.1111/1468-5957.00370
(65). Pinegar, J. M., & Wilbricht, L. (1989). What Managers Think of Capital Structure Theory: A Survey. *Financial Management*, *18*(4), 82. https://doi.org/10.2307/3665800
(66). Poursoleyman, E., Mansourfar, G., & Abidin, S. (2021). Debt structure: A solution to the puzzle of capital structure. *International Journal of Managerial Finance*, *19*(1), 22–47. https://doi.org/10.1108/IJMF-03-2021-0155
(67). Rajan, R. G., & Zingales, L. (1995). What Do We Know about Capital Structure? Some Evidence from International Data. *The Journal of Finance*, *50*(5), 1421–1460. https://doi.org/10.2307/2329322
(68). Ross, S. A. (1977). The Determination of Financial Structure: The Incentive-Signalling Approach. *The Bell Journal of Economics*, *8*(1), 23–40. https://doi.org/10.2307/3003485
(69). Ross, S. A., Westerfield, R. W., & Jaffe, J. (2008). *Corporate Finance* (8th edition). McGraw-Hill/Irwin.
(70). Scholes, M., Wilson, G., & Wolfson, M. (1992). Firms Responses to Anticipated Reductions in Tax Rates—The Tax-Reform Act Of 1986. *Journal of Accounting Research*, *30*, 161–185.
(71). Seifert, B., & Gonenc, H. (2010). Pecking Order Behavior in Emerging Markets*. *Journal of International Financial Management & Accounting*, *21*, 1–31. https://doi.org/10.1111/j.1467-646X.2009.01034.x
(72). Shleifer, A., & Wolfenzon, D. (2000). Investor Protection and Equity Markets. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.245448
(73). Shleifer, A., & Wolfenzon, D. (2002). Investor Protection and Equity Markets. *Journal of Financial Economics*, *66*(1), 3–27.
(74). Shyam-Sunder, L., & Myers, S. C. (1999). Testing static tradeoff against pecking order models of capital structure1This paper has benefited from comments by seminar participants at Boston College, Boston Unsiversity, Dartmouth College, Massachusetts Institute of Technology, University of Massachusetts, Ohio State University, University of California at Los Angeles and the NBER, especially Eugene Fama and Robert Gertner. The usual disclaimers apply. Funding from MIT and the Tuck School at Dartmouth College is gratefuly acknowledged. We also thank two reviewers, Richard S. Ruback and Clifford W. Smith, Jr., for helpful comments.1. *Journal of Financial Economics*, *51*(2), 219–244. https://doi.org/10.1016/S0304-405X(98)00051-8
(75). Solomon, E. (1963). Leverage and the Cost of Capital. *Journal of Finance*, *18*(2), 273–

279.
(76). Stiglitz, J. (1969). A Re-Examination of the Modigliani-Miller Theorem. *American Economic Review*, *59*(5), 784–793.
(77). TIBI, L., YAMB Martine, L. belle, TUEGNO MATAWO FOKOU, R. J., & NDOUNBISSI, R. (2024). Recours au financement alternatif des TPE du secteur informel au Cameroun: Un regard sur les facteurs explicatifs. *International Journal of Accounting, Finance, Auditing, Management and Economics*. https://doi.org/10.5281/zenodo.10634367
(78). Titman, S., & Wessels, R. (1988). The Determinants of Capital Structure Choice. *The Journal of Finance*, *43*(1), 1–19. https://doi.org/10.1111/j.1540-6261.1988.tb02585.x
(79). Trahan, E. A., & Gitman, L. J. (1995). Bridging the theory-practice gap in corporate finance: A survey of chief financial officers. *The Quarterly Review of Economics and Finance*, *35*(1), 73–87.
(80). Vilasuso, J., & Minkler, A. (2001). Agency costs, asset specificity, and the capital structure of the firm. *Journal of Economic Behavior & Organization*, *44*(1), 55–69.
(81). Williamson, O. E. (1988). Corporate Finance and Corporate Governance. *The Journal of Finance*, *43*(3), 567–591. https://doi.org/10.1111/j.1540-6261.1988.tb04592.x